HUMAN RESOURCES DEVELOPMENT FOR ASIAN CORE INDUSTRIES WITH RESPECT TO JAPAN

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ABSTRACT:

Some ten years ago, manufacturing businesses were centered on assembly of parts. But the focus of manufacturing has since been expanding to a wide variety of core industries that includes making dies and moulds which are the basis for parts manufacturing. This is partly because companies setting up shop in Asian countries have boosted their local procurement efforts for the purpose of cutting costs and evading exchange risks. As with the basic technologies, the basic skills for core industries include, among others, heat treating, measuring, grinding, polishing, lapping, and planning (proposal and layout preparation). These skills can also be subdivided. For example, grinding involves surface grinding skills, cylinder grinding skills, internal grinding skills, jig grinding skills and others. FADMA (Federation of Asian Die & Mould Association) is a forum of Asian die & mould industry associations. The present membership includes Japan, South Korea, Taiwan, China, Singapore, Malaysia, Thailand, Philippines, **India**, Indonesia and Australia. It has been working hard to address various issues of the die and mould industry. Recently, special attention is given to the standardisation of skill certification criteria.

KEY WORDS: Human Resources, management, education, asian countries, Japan.

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INTRODUCTION

In recent years, manufacturing industries have been emerging dramatically in China and other Asian countries, covering all areas of manufacturing from textiles and appliance products to motor vehicles, to semiconductors. Some ten years ago, manufacturing businesses were centered on assembly of parts. But the focus of manufacturing has since been expanding to a wide variety of core industries that includes making dies and moulds which are the basis for parts manufacturing. This is partly because companies setting up shop in Asian countries have boosted their local procurement efforts for the purpose of cutting costs and evading exchange risks. But the basic technologies and skills required in core industries, unlike those for assembly work, cannot be acquired in a short period of time irrespective of the sophistication of machine tools and other manufacturing equipment used. There are many things which require long years to learn. At the same time, from the standpoint of local manufacturing businesses, if they are to remain competitive, the need is urgent to obtain the necessary core technologies and skills; they cannot afford to wait for fully qualified people to grow locally within a limited time frame. With full awareness of the importance of the core technologies and skills, the government of each Asian country has set about to boost education and training programmes to develop human resources not only for the benefit of companies operating locally but for the purpose of surviving as a nation in Asia. This article discusses, together with the author's personal views, the present status and issues of technology and skill development in association with the core industries in Asia.

HUMAN RESOURCES EDUCATION IN CORE INDUSTRIES

Human resources education in core industries extends to a very wide scope. It can be classified broadly into four categories:

- Education of basic technologies
- Education of basic skills
- Education of CAD and other application software
- Education of core industry business management

Let us look at these categories one by one:

Education of basic technologies

The basic technologies required for core industries include material technology, heat treating technology, measuring technology, grinding technology, cutting technology and surface finishing technology. These are further subdivided. For example, grinding technology encompasses, among others, the knowledge about grindstones, the knowledge of relationship between the grinding speed and the surface to grind, and the knowledge about grinding fluids. In addition, the basic technologies associated with applied mechanics and machinery mechanics are also required. But these are required only in specialised fields and are not necessarily a must for engineers in the field. However, the aforementioned technologies are required, in greater or lesser degrees, irrespective of the types of work.

Education of basic skills

As with the basic technologies, the basic skills for core industries include, among others, heat treating, measuring, grinding, polishing, lapping, and planning (proposal and layout preparation). These skills can also be subdivided. For example, grinding involves surface grinding skills, cylinder grinding skills, internal grinding skills, jig grinding skills and others. Ordinarily, these skills are acquired on an OJT (on-the-job-training) basis. In the preparatory stages, however, it is also necessary to acquire relevant knowledge from textbooks. Education of basic skills is the most important part of core industries education. At the same time, this area of education is one of the most difficult things to carry out because it hinges on the number and quality of instructors available.

Education of CAD and other application software

CAD/ CAM is a new type of technology emerging in the area of die and mould manufacturing. With the increasing digitisation of product data used as the basis for die and mould manufacturing, CAD/CAM is getting more and more important in this area. Since textbook learning is possible for CAD/ CAM, it can be learned relatively easily compared

with other kinds of technology. However, because CAD/CAM technology is continuously evolving year after year, it will be necessary for users to make capital expenditure in new hardware (PC, etc.) and software.

Education of core industry business management

Core industries (the die and mould industry in particular) are thin-margin trade. Moreover, they are less advantageous in terms of cash flow because large capital expenditure is always required for continuous equipment updating and the period of production is long. The die and mould industry is relatively suitable for medium and small businesses, and there are often cases in which the proprietor of the business also works on the shop floor. Hence there is the need for business management education.

CURRENT STATUS OF CORE INDUSTRIES IN ASIA

Objectives for learning technologies and skills

Different countries set different objectives for acquiring technologies and skills. In Japan, the purpose of learning new technologies and skills is to get an important job, promotion and higher pay within the company. Also, the "for the benefit of the company" mentality is not a small aspect of learning against the background of employment for life. In the rest of Asia, workers want to learn new technologies and skills for their own benefit. That is, they want to sell themselves for the highest possible wage by obtaining state-of-the-art technologies and skills. The president of the Die and Mould Industry Association of Malaysia gave the following comment to the Japanese:

"Japanese business people unanimously say that in Malaysia it is difficult to let workers learn new technologies and/ or skills due to job hopping; even if OJT is conducted, workers easily move to other businesses as soon as they have obtained the desired technologies and/ or skills." They lament that things are difficult in Malaysia. But actually, the problem lies on the companies which employ them. Workers opt for better job opportunities because they think their wages are not commensurate with their skills. If companies fail to pay reasonable wages to qualified workers, job hopping will persist. This is not particular to Malaysia.

Preparation of standard skill certification criteria

FADMA (Federation of Asian Die & Mould Association) is a forum of Asian die & mould industry associations. The present membership includes Japan, South Korea, Taiwan, China, Singapore, Malaysia, Thailand, Philippines, **India**, Indonesia and Australia. It has been working hard to address various issues of the die and mould industry. Recently, special attention is given to the standardisation of skill certification criteria.

As widely perceived, globalisation is well under way in East Asia, giving rise to frequent traffic of labour across borders. One of the issues surfacing in this situation is that different countries employ different criteria for skill certification. For example, there is no compatibility between Singapore's Class 1 skill certification and Malaysia's Class 1 skill certification. It follows that there can arise a case in which no common skill determination guideline is available for the employer and the employee. Therefore, a Malaysian technician qualified with Class 1 skill certification has to acquire a Singaporean Class 1 skill certificate afresh if he or she wants to land a job with a pay commensurate with his or her skills. There exist similar cases between Thailand and Malaysia and between Malaysia and Philippines as well. Recently, more and more skilled Japanese workers are moving to Asian countries. In these cases, too, their Japanese skill certification cannot be accepted in other Asian countries. To address the situation, FADMA, at the initiative of Singapore, Taiwan and Malaysia, has set about working out standards for skill certification criteria in the Asian region. With the increasing fluidity of core industry labour in Asia, standardised skill certification criteria will have a very important role in the future.

Promotion of acceptance of engineers and technicians from Japan

In Asia, there exists mounting demand for human resources education among core industries. But every country is plagued with a shortage of qualified instructors. To address the problem, Asian countries are keen to accept instructors (technicians in particular) from Japan. They are accepted by not only companies but government-run educational institutions. Ironically, if the Japanese domestic core industries continue to decline, it is expected that more and more skilled technicians working in Japanese companies will leave Japan to work overseas as instructors.

Government-sponsored education for technical differentiation

With the increasing fluidity of labour among Asian countries, governments are placing more and more emphasis on improving the core competence of technologies and skills of their own. This is particularly so with CAD/ CAM technology because it is less affected by the level of shop-floor experience. India intends to become the world's leader in the area of CAD/ CAM by pushing with the development of CAD technology through joint efforts between the government and private sectors. In the case of China too, high-level of CAD/ CAM education is taking place in the Beijing area with a relatively high concentration of brain workers. Both countries are getting ahead of Japan in some areas of 3D CAD with respect to hardware systems and software technology.

In Singapore, where the labour population is small, emphasis is placed on technical education in such areas as automated processing and the Internet.

CURRENT STATUS OF ASIAN COUNTRIES

Now let us have an outline look at the current status of technology and skill training for core industries in Asian countries.

1. Malaysia

In Malaysia, technical and skill training includes primarily: education and training by Japanese manufacturing companies setting up shop in the country to their local parts suppliers, intra-company education in cooperation with Japanese die and mould manufacturing companies, education by Malaysian government organisations, and intra-company education by Malaysian companies on their own. Since more than 90% of the local Malaysian dies and moulds manufacturing companies are affiliated with Chinese businesses, there also takes place education utilising the networks of Chinese residents in Malaysia. Anyway, it can be said that education provided by Japanese companies to local suppliers has played the leading role in technical training and education in Malaysia. Since Japanese consumer electronics companies were the first to set up shops in this country, core industries associated with this field have been well developed locally. The promotion of core industries in the TPM (Technopolis Malaysia) area is a typical educational initiative by the government. TPM has the role of an incubator of IT related businesses with training and education for various CAD/ CAM software companies and their employees taking place. Though no significant result has so far been produced, its future is promising. Recently, engineers and technicians trained overseas (particularly in Singapore) have also started education and training initiatives of their own.

2. Thailand

In Thailand, Japanese businesses and government organisations have been playing a major role in local technical and skill training. This trend has been building up as Japanese motor companies have started operating in the country. Training in core technologies and skills is conducted mainly on an OJB basis. But a shortage of technical instructors from Japan is posing a major problem. In 2001 Japan started a die and mould technology support project, which provides die and mould technical training in Thailand. It is expected that the project would help make good the shortage of instructors. There are also plans to provide educational services by utilising a forum created in 2004 of Japanese die and mould manufacturing companies operating in Thailand. Similar pattern is running in other Asian countries also.

3. Philippines

The Philippines is plagued with the shortage of engineers and technicians in all the fields of manufacturing, let alone core industries. Technical training conducted until last year under Japan's die and mould technology support project was less than adequate to meet the Philippines' demand because only a limited number of trainees had been acceptable. When it comes to technical education, therefore, the Philippines has no choice but to depend on private companies for technical education. In the Philippines, almost all people can speak English because it is official language of the country. This partly helps Filipino engineers go abroad instead of remaining in their country; engineers trained at school or in companies tend to seek well-paid jobs in Taiwan and the United States, in order to prove their skills. To help develop the Philippine manufacturing industries, it would be necessary to implement educational programmes at the grade school level to teach youngsters the pleasure of creation.

4. Taiwan

In Taiwan, technical and skill training for core industries is conducted in various ways. Reflecting a long history of technological cooperation with Japan, Taiwan has a variety of good engineering training programmes conducted jointly with Japanese companies. Many businessman and elderly people can speak Japanese. This helps activate OTJ training in companies. Also, many government-run research institutes provide a variety of training programmes. Quite a few companies have vocational training institutions of their own and they employ good students after graduation. Unlike their Japanese counterpart, the Taiwanese die and mould industry has a well developed division of labour. This helps companies conduct in-house OTJ in specialised technologies and skills. The next challenge for the die and mould industry is to further improve the quality and reliability of products. This will require a large variety of special technologies and skills. It is expected that a highly specialised industry structure like the one in Taiwan would help expedite technical and skill training in specialised fields.

5. China

In China, core industry training varies with areas, industries and companies. In the area south of Hong Kong, companies moved from Taiwan and Hong Kong provide in-house training on an OJT basis. In the Beijing area, where many universities and research institutes are situated, state-of-the-art CAD and other software technologies are burgeoning. In the Shanghai area, American, European and Japanese companies operating in Pudong conduct technical and skill training of their own. Some of them provide in-house schooling, which is a very unusual educational method with no parallel found elsewhere in the world. A certain Taiwan-based company offers free schooling-based training to many students gathered from all around China with free board and accommodation, plus a monetary allowance. And the company recruits only elite students from among them. This method is employed also by a Chinese company based in Ningbo. This is presumably because in China, the state educational systems are inadequate to cope with the rapid emergence of new industries. Needless to say, the above-mentioned two schools provide not only vocational training but also general education in the same manner as ordinary schools do. Thus, China provides a variety of education and training in various manners. But schools are still absolutely in short supply and basic technical and skill training is far less than adequate.

6. Singapore

Singapore now offers world-class, maybe the world's best, technical education and training systems for core industries in general and for the die and mould industry in particular. And the state-run ITE (Institute of Technical Education) is the key player. ITE provides class-room basic technical education and skill training using a large variety of machine tools, CAD systems and measuring instruments. In the die and mould course, the out-year students (third year) are required to receive orders for dies and moulds from private companies, design and make the products and deliver them. At the time of graduation, all students will have acquired the ability to design and make dies and moulds. At present, Singapore invites its school students not only from within the country but from all over Asia. The Singapore Die and Mould Industry Association has special arrangements with overseas die and mould industry associations in the field of education and training for further cooperation. Recently, in conjunction with the branching out of Singaporean business into China, Singapore accepts a large number of students from China while backing up Singapore businesses operating in the country. The country also has devised ways of its own to cope with heavy capital expenditure required for schools: Under cooperative programmes with schools, machine tool manufacturers and other equipment vendors lend state-of-the-art- equipment to schools free of charge to help spread the brand recognition, encourage students to buy their products after graduation, and provide a showcase for school visitors from around the world. Anyway, this is a very logical system for both education and school management.

7. Other Asian countries

Other Asian countries with burgeoning manufacturing industries include Indonesia, Vietnam and Cambodia. In these countries, education and training facilities are still inadequate. To meet the situation, companies setting up shop locally opt to provide in-house training. In the case of Vietnam, in particular, Japanese and other foreign companies are

planning to start local operations. For the promotion of Vietnamese manufacturing industries, the need is urgent to provide for core industry education and training.

HUMAN RESOURCES DEVELOPMENT FOR CORE INDUSTRIES IN JAPAN

Today, Japan is positioned at the leading edge in die and mould technology and workers' skills, thanks partly to the well-structured national compulsory education system but mainly to the generation-to-generation transfer of technologies and skills through OJT within each die and mould manufacturing company. In the rest of Asia, as discussed above, steady efforts are being made to develop and improve its core industry training and education systems as state-sponsored projects.

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